

Lyndon B. Johnson Space Center

# roundup



**One for the history books**

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# JSCdirector

## On the cover

*After Space Shuttle Discovery safely docked to the International Space Station during STS 120, the hatches were opened and a landmark moment took place. Shuttle Commander Pam Melroy and International Space Station Expedition 16 Commander Peggy Whitson made space history, marking the first time women have commanded both spacecraft at the same time.*



I am writing this column shortly after the completion of the STS-120 mission, and I wanted to express my appreciation for the outstanding level of professionalism and expertise demonstrated by our entire space team. The NASA civil servants and contractors from virtually the entire agency worked together seamlessly to come up with an ingenious solution to a potentially serious problem with the torn solar array wing on the International Space Station (ISS), and they did it within 72 hours. The STS-120 crew was highly complimentary of the well-thought-out and clear procedures they received, which enabled them to manufacture the “cuff-links” with materials onboard and execute an extremely demanding repair task. The media seemed to recognize the difficulty of the task and the superb work that went into devising the solution and gave NASA excellent coverage. The STS-120 crew had already delivered the Harmony Node and executed three planned spacewalks before performing the repair EVA.

I’m as superstitious as anyone about trumpeting the success of our missions, but I am terribly proud of what this agency is accomplishing. We have now flown three wonderfully successful shuttle missions to the International Space Station in the last five months, overcoming real-time challenges with seeming ease on each one, and we have another shuttle mission scheduled before the end of the year. The ISS crews, including Clay Anderson/Expedition 15 returning with the STS 120 crew, have performed wonderfully, as has the entire ISS ground team.

I’ve come to believe that you had to have stepped away from NASA for 14 years, as I did, to truly appreciate how far we’ve come in learning how to live and work in space. The learning curve has been steep since the first humans left planet Earth 46 years ago, but we have made ourselves at home in space now. The knowledge and lessons learned that we have gained during those 46 years are being applied both to the final assembly of the ISS and the design and development of the Constellation program. I have had friends outside the space program say “you guys make it look too easy.” We know it’s not that easy, but when the experts and professionals do their jobs well it tends to look that way. It’s a pleasure and a privilege to be able to work with such a wonderful team. I am looking forward to another great year in 2008.

A handwritten signature in blue ink that reads "Mike".

# A stressful season

By Catherine E. Ragin

**If basting a delectable turkey** and finding the perfect gifts for all your family members isn't difficult enough... There's also your day job to add to the mix of stressors facing everyone this holiday season. And while NASA is not slowing down missions to spread a little tinsel, taking care of ourselves and each other should be the top concern this holiday season.

"The center genuinely cares about the well-being of the entire JSC workforce and provides many services to help employees balance work and family responsibilities," said Natalie Saiz, Johnson Space Center director of Human Resources.

"Stress affects us in different ways, and some coping mechanisms are healthier than others," said Mike Coats, JSC director. "We all need balance in our lives. I have never had to tell anyone to work harder, but I frequently have had to tell people in the aerospace business to 'go home and get a life.'"

A series of life events can bring on a type of stress that eventually eats away at a person's ability to cope. Many times, this is directly related to a modern lifestyle that leaves little time for relaxation.

"It could be due to something going on at work, a trauma, the impact of physical or mental illness, or a series of events where people just don't get a break," said Jackie Reese, director of the JSC Employee Assistance Program (EAP). "That happens a lot in our culture because most families are two-income families; they are trying to raise kids and they are in a very high-achieving community."

The holidays can add to what would otherwise be considered a normal amount of stress.

"The holidays often create situations in which people feel that they are spread too thin, or don't have enough time to get everything done. We often have an image of how the holidays should be that is often unrealistic, given the demands of work and family," Reese said. "Holidays (can) remind us of losses. Also, we often take time to reflect on our lives and sometimes focus too much on the disappointments and not enough on the blessings. Keeping it simple tends to make the holidays much more enjoyable."

And while we can almost always handle the additional demands, there are times when it gets to be too much for one person.

"Most of the everyday problems that people have they cope with, but sometimes life throws something at you that's bigger than what you have in your toolbox," Reese said. "Until it happens, people don't realize how much it can take out of them."

Many of us also incorrectly assume that we can deal with it ourselves, without outside help.

"There is still a belief that there is a separation between mind and body, and people forget to look at their brain like any other organ. Just as stress can impact your GI tract, it's going to impact your brain, too. People are reluctant to acknowledge that because we, as humans, like to think we have control over our brains, our thoughts and our brain's function," Reese said. "But there's a lot that we don't have control over, because it's chemically driven."

Instead of just hoping the stress will go away on its own, you can do many things to actively manage it.

"Humans are social beings, and being able to talk about the joys and stresses of life is critical," Coats said.

Just being there for someone, to listen to their worries, can do a world of good. JSC also offers the EAP, which is an excellent resource if you're feeling that the stress in your life has become difficult to manage.

"The reason people need an EAP is because life presents problems, and just like people have to learn how to take care of their teeth, muscles and body systems—your mind is part of that, and problems tax people's minds. They need to learn how to cope and find different ways of resolving things," Reese said. "A lot of what we do is really not mysterious. We do a lot of teaching and coaching to give people life skills—the kind of skills not taught in high school."

To help make the holidays a positive experience as we endeavor to do big things in the cosmos, Reese offers the following advice. "Keeping things in perspective is very important. I often tell people to think about the holidays in terms of the memories they want to look back on. Would those be memories of being in crowded malls or sitting around the table playing a board game with your family? Making sure you get enough sleep, healthy foods and exercise can also help you stay grounded during the holidays."



Spotlight on...

# Norman H. Chaffee

Education Outreach Volunteer

**How long have you been with NASA?** I came to Johnson Space Center (then it was Manned Spacecraft Center) in the spring of 1962 and retired in the fall of 1996. I immediately returned to work in the Education Office as a rehired annuitant for two years. After that, I was a contractor supporting the Education Office part-time for seven years. For the last two years, I have served just as an unpaid education outreach volunteer. But, because of my level of activity, the Education Office has allowed me to keep a small office space with an onsite phone number and computer.

**What kind of hobbies or interesting things do you do away from the office?** My favorite hobbies these days are interacting with family, children, step-children and grandchildren. (I have them all over the place—Houston,

Beaumont, Chicago, San Diego, Atlanta, Austin.) And, of course, my passion these days is education outreach, to inspire youngsters today to complete their education. I am involved with the JSC education outreach program and also have special associations with Houston Independent School District (ISD), Clear Creek ISD and Pasadena ISD.

I also wear several other hats that really occupy a lot of my time: I am president of the JSC Chapter of the NASA Alumni League (the NASA retirees club); I am president of my community association in Pasadena; and I am active in both the American Institute of Aeronautics and Astronautics and in the National Management Association chapters at JSC.

**What is your favorite food?** I have a broad spectrum of favorite foods. I love great Tex-Mex; I dote on good Indian and Italian cuisine; and I save my money so I can go to a nice steakhouse once in a while for a good steak with all the trimmings!

**What is your favorite sport?** My favorite sport is WATCHING pro football, usually the Houston Texans, although that has been a challenge for several years.

**What is your favorite CD?** I am a classical music and opera fan, and my favorite CDs are those of the late (and greatly missed) Luciano Pavarotti in concert and of the opera “La Boheme” by Giuseppe Verdi.

**What is the last good book or article you read?** I am a history and civil war buff, and the last two books I read were “A Team of Rivals” by Doris Kearns Goodwin, about Abraham Lincoln’s administration and a detailed military history of the Gettysburg campaign in 1863. I am currently reading “The World Is Flat” by Thomas Friedman, an explanation of the meaning of the new global economy.

**What is your idea of a perfect vacation?** My idea of a perfect vacation is a leisurely visit to a foreign area I have not visited before. Not a group tour that is a “hurry—scurry” get on the bus and go to the next stop activity, but rather going somewhere and staying for a while to really get to know the place. I am hoping to visit Greece soon while I still have the energy to do it!



*Norman H. Chaffee honored by NASA with a presentation of the Exceptional Public Service Medal for his work in education outreach. Norm and his granddaughter, Brenna Chaffee, with Mike Coats and Bob Cabana.*



*Norm Chaffee has spent decades within the NASA family. Now, as an education outreach volunteer, he loves inspiring the next generation of explorers.*

**What is the best movie in your collection?** The favorite movies in my collection are Mel Brooks' classics: "Young Frankenstein" and "Blazing Saddles." I die laughing every time I watch them!

**What is the coolest part of your job?** The coolest part of my job as an education outreach volunteer is to see the excitement in a youngster when I show them how interesting and "cool" engineering and science can be, and they understand that a career in these fields can really be a possibility for them!

**What does JSC mean to you?** JSC means a tremendous amount to me. It comes close to defining me because of the long professional association with its missions and staff. I suspect I will continue to support JSC and its activities with my full energy as long as I am able to get up out of my chair and can intellectually still function! JSC has supported me and my family and given a real meaning to my career that I am very proud of.

**What do you most look forward to at NASA?** I most look forward to a successful lunar return program. At one time in my career, I was manager of the lunar and Mars Exploration Level II Office at JSC, and I so wanted the nation to aggressively get back to the lunar surface for permanent base operations, and to then use that experience as a stepping stone to human exploration of Mars. That is now, after many years, a real future goal for the United States, and I hope to live long enough to see it accomplished!

**What is your best memory at JSC?** My best memories at NASA and from my career are the people I worked with. I was so fortunate to work for and with such an amazingly skilled, dedicated and "fun" bunch of folks, and it was later my honor and pleasure to mentor, train and lead some of the folks who are in leadership roles today. I particularly remember the night Apollo 8 went into lunar orbit, and we got the first radio response indicating they had achieved lunar orbit. I was working in the Engineering Directorate Mission Evaluation Room that night—it was Christmastime—and later that evening Frank Borman began reading from the first chapter of Genesis as we watched a stark lunar landscape pass by on the TV, with a beautiful Earth in the background. It still brings tears to my eyes!

**What is your favorite quote?** My favorite quote is the well-known statement attributed to my buddy Gene Kranz: "Failure is not an option."

**What would people be surprised to know about you?** It is hard to know what trait I have that would surprise people... Maybe because the NASA culture so emphasizes being positive, aggressive, confident, decisive—and I grew up in that culture and adopted it in the main—people would be surprised that I have a tender and soft side that I try to hide, but I reserve it for my children, grandchildren and my little dog! For all of them I am a softy and a pushover!

**What is a quality you most admire in people?** The quality I most admire in people is an informed, decisive leadership style that reflects a deeply inquisitive nature, and who are not afraid to admit a mistake or reverse a decision when better information is available.

**Who are your heroes?** I have lots of heroes. Historically, my main man is Abe Lincoln! My dad showed me how to be a thoughtful and caring man, husband and father. And lots of folks at NASA showed me how to operate professionally. I am particularly grateful that I got to see Dr. Gilruth and George Low in action, and that I had the great good fortune to be "raised" professionally by such pros as Guy Thibodaux, Henry Pohl and Chet Vaughan in the old Propulsion and Power Division.



A photograph of astronaut Scott Parazynski working on the International Space Station. He is silhouetted against the bright orange glow of a partially extended solar wing. The solar array is a large, complex structure with many panels and cables. The background is the dark void of space.

# Winning team completes challenging mission

## *Construction work achieves new heights*

*While anchored to a foot restraint on the end of the Orbiter Boom Sensor System, Scott Parazynski, STS-120 mission specialist, assesses his repair work as the solar array is fully deployed during the mission's fourth spacewalk while Space Shuttle Discovery is docked with the International Space Station.*

**it** was high drama on live TV. Mission Specialist Scott Parazynski worked while balanced at the end of an extended robotic arm, silhouetted against the brilliant orange glow of a partially extended solar wing. Marring the wing were two visible tears in the panels. This was no ordinary spacewalk, and it was destined to become the centerpiece for this exciting and highly successful mission that was far from routine.

Bookended by an on-time launch and landing, the successful work on space shuttle mission STS-120 showcased outstanding talent and teamwork among the space shuttle astronauts, International Space Station crew and mission teams on the ground.

Lifting off into a blue Florida sky on Oct. 23, the perpetually upbeat crew already had a full agenda with five planned spacewalks. However, due to complications during the unfurling of a P6 solar array, the spacewalks were reduced to four to accommodate the repair work needed.

The primary payload carried aboard *Discovery* was the Italian-built U.S. Harmony module. This pressurized module is key to the following three shuttle flights set to carry the European Columbus lab and the two pressurized Japanese Kibo modules. Harmony provides the connecting point between these modules and the U.S. Destiny laboratory, which is already in place, forming an international crossroads in space.

Getting down to business, the crew's inspection of *Discovery* went well, and the shuttle showed no signs of damage from liftoff. The orbiter chased the International Space Station until the rendezvous on the third day of the mission.

With the shuttle safely docked to the station, the hatches were opened and a landmark moment took place. Shuttle Commander Pam Melroy and the station's Expedition 16 Commander Peggy Whitson made space history, marking the first time women commanded both spacecraft at the same time. One of the first orders of business was a crew member swap, with Dan Tani joining the station crew in exchange

for Clayton Anderson, who would return to Earth aboard *Discovery* after a five-month stint at the station.

### Harmony in space

Installing Harmony in its temporary location was the focus of the mission's first spacewalk, conducted by Parazynski and Doug Wheelock. With the duo assisting from outside, European Space Agency astronaut Paulo Nespoli acted as spacewalk coordinator while Stephanie Wilson, Tani and Anderson worked from inside using the station's robotic arm to remove Harmony from *Discovery*'s payload bay and bring it into position beside the Unity module. During the six-hour spacewalk, Parazynski and Wheelock also worked atop the station, retrieving an antenna from the Z1 truss and readying the P6 for its move to the far end of the port truss.

The following day was the "grand opening" of Harmony, as named by schoolchildren. The module added 2,666 cubic feet of additional volume to the station, increasing the living space by nearly 20 percent. After Harmony's hatch was opened, Whitson and Nespoli were the first inside, where they began set-up operations. After *Discovery*'s departure, the station crew will relocate Harmony to its permanent location at the end of the U.S. Destiny lab.

### Taking a few walks

Parazynski was paired with Tani for the mission's second spacewalk. On the agenda was the relocation of the P6 truss with its two folded solar wings. The P6 served as the original power source for the station from its temporary position atop the Z1 truss. Wilson and Wheelock worked the station's robotic arm to move the truss once the spacewalkers had unbolted it. As the robotic maneuver to relocate it was in progress, the two spacewalkers parted company, with Parazynski conducting external work on Harmony while Tani moved to the starboard truss to inspect a troublesome solar array rotary joint on the starboard side of the station.

Tani collected samples of “shavings” he found in the mechanism. Later in the six-and-a-half-hour spacewalk, the two astronauts met up again to finish external work on Harmony. The P6 remained overnight on the robotic arm in a “park” position.

The next day, Wilson and Pilot George Zamka used the shuttle’s robotic arm to take a handoff of the P6 from the station’s arm, operated by Tani and Anderson. Once the station arm was relocated, Tani and Anderson used it to take back the P6 and hold it in position for the mission’s third spacewalk.

On that spacewalk, Parazynski and Wheelock were paired up again to finalize the installation of the P6 in its permanent home at the end of the station’s port side. The installation was flawless, and Parazynski was asked to look at a rotary joint on the port side to use for comparison with the malfunctioning one previously examined by Tani on the starboard side. As the spacewalk drew to a close, the extension of the two P6 solar wings got underway from inside the station. The first went smoothly, but as the second wing unfolded, a guide wire snagged, causing tears in two of the panels. With the wing 80 percent extended, the operation was halted and the spacewalkers came inside after seven hours. The partially deployed array was producing power, but a plan was needed to allow it to fully extend.

## Planning ahead, going beyond

In the ensuing three days, spacewalk repair plans were developed round-the-clock on the ground while the astronauts prepared tools and repair materials in space. Using strips of aluminum, a hole punch, a bolt connector and 66 feet of wire, the crew constructed hinge stabilizers that would take the pressure off the damaged hinges on the solar array. They insulated tools with tape to protect against electrical currents produced by the array.

The plan was to, once again, send Parazynski and Wheelock outside. Parazynski would work to make the repairs while positioned on the end of a boom normally used to inspect



*Astronaut Dan Tani (top center), Expedition 16 flight engineer, participates in the second of four completed spacewalks as construction continues on the International Space Station.*

the shuttle. The boom would be attached to the end of the space station’s robotic arm, operated by Wilson and Tani. Wheelock would be positioned near the station’s truss to help visually guide the movement of the arm near the solar wing.

With plans and tools prepared, the day arrived and the two galactic repairmen once again ventured into space. Compared to normal spacewalks that have been practiced on Earth, this was uncharted territory. Riding at the end of the boom, it took Parazynski about an hour-and-a-half to reach the worksite, located about 165 feet down the station’s truss and 90 feet out on the damaged solar wing. With Wheelock positioned to help keep him at a safe distance from the array, Parazynski—who is also a doctor—performed some delicate “surgery” on the damaged wing by cutting the snagged wire and installing the stabilizers made by the crew to strengthen the array’s structure at the damaged area.

Once the repair was made, the robotics team backed the spacewalker off to a safe distance, and the whole team, in space and on Earth, watched as the array was carefully deployed to its full length. They had success after more than seven hours outside.

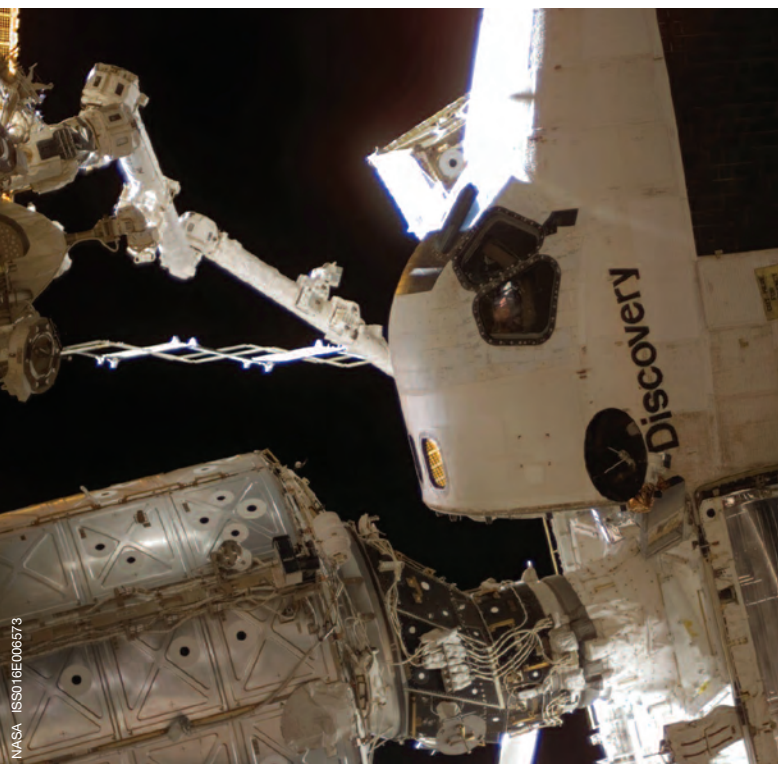
“This is truly a triumphant moment for NASA,” Parazynski said later after landing. “I think we obtained the summit and then some.”

## Beautiful day, triumphant return

With all the major work of the mission completed, a spacewalk by the station crew was postponed until after the shuttle’s departure, and diagnoses of the rotary joint problem were left for a later mission. The STS-120 mission was a resounding success, and proof, once again, that learning to work in space and adapting to overcome unforeseen challenges are important parts of building the station.

The two crews said their goodbyes, and the shuttle crew prepared for its return to Earth after 15 days in space. Nov. 7 proved to be a beautiful fall day on the Florida coast, and Space Shuttle *Discovery* touched down on the first landing opportunity on runway 33 at NASA’s Kennedy Space Center. After traveling 6.25 million miles on 238 orbits of the Earth, they were home.

“When I look back at our mission, it seems like we kind of hit a triple home run,” Commander Melroy said a few hours after landing *Discovery*. “It was an amazing thing to watch a large organization like NASA pivot so easily to tackle the problem.”



*Space Shuttle Discovery, docked to the Pressurized Mating Adapter (PMA-2) on the International Space Station, is featured in this image photographed during the second spacewalk for the STS-120 mission.*



# gemini rising

## susana and stephanie



By Anna Roth

NASA team members Alma Stephanie Tapia and Susana Tapia are twins who developed their passion for science early on, only to later establish their dream careers in the space program. It is also coincidental that these two were born under the sign of Gemini, the zodiac sign for twins, which also serves as a reminder of one of the pioneering exploration programs at NASA.

### First-generation Americans

Stephanie and Susana were born on July 7, 1981, in El Paso, Texas. Because both parents are first-generation immigrants to the United States—their father from Argentina and their mother from Colombia—Stephanie and Susana's first language was Spanish. In fact, when they entered elementary school, neither spoke any English at all. "We were put in a bilingual program, which I'm a huge advocate of—I think they're so wonderful because they allow children to retain their own culture and their first language and still learn a second language. So we learned to read and write in both languages," said Susana.

Looking back, Susana marvels at how much confidence she and Stephanie instilled in each other at school. "We always had that support structure, and that confidence to do anything, because we always had somebody we were so familiar with. I never felt alienated in the classroom or like I didn't belong." Both girls ran

track and cross country, played instruments—Stephanie the cello and Susana the flute—and excelled at math and science.

### A dedicated support crew

They say that their love of learning and their strong work ethic came from their parents. Susana says her father taught the twins to love education as something beautiful, not as a chore. "I think that is something that Stephanie and I have, and one of the reasons we went into the fields that we did. We felt they were fields in which you never stopped learning. It wasn't like you learned a skill and that was it. You always have a new challenge, a new thing to learn, a new way of looking at something." And it was their mother who taught them to be hard workers. "She was one of those people who, no matter what obstacles she came across, always had that go-forward attitude—you never give up," Susana said.

### Blueprint for a pair of futures

Stephanie's third grade teacher loved rocks and was constantly bringing in different specimens—quartz, geodes and others—and Stephanie became fascinated. Stephanie started her own collection and would pick up rocks every place they went and thought she wanted to be a geologist. It was only later, in high school, when she was exposed to the field of metallurgy, that she realized it was the perfect fit.



Susana's moment of realization was also in high school. Her chemistry teacher saw more in Susana than Susana saw in herself and recommended her student try for a higher level. Susana took advanced placement chemistry, did well and thought about taking chemical engineering classes in college.

They were the first in their families to graduate from college. Stephanie received her undergraduate degree in metallurgy and materials engineering from University of Texas, El Paso (UTEP), while Susana received her bachelor's degree in chemical engineering from New Mexico State University in Las Cruces, N.M.

## Destined for NASA

While at UTEP, Stephanie did two things that heavily influenced both her future and Susana's. As she learned more about the engineering field, she says she "started looking at where I would want to work, and NASA really began standing out." At the same time, she was heavily involved in the organization of Mexican American Engineers and Scientists (MAES). Stephanie spoke so highly of the organization that Susana decided to get involved as well. During their senior year, both attended a MAES symposium in Phoenix, Ariz. While there, Susana presented a research paper and caught the eye of NASA recruiters.

Stephanie went on to graduate school at the University of Florida in Gainesville, while Susana was hired by NASA and began her work in testing at the White Sands Test Facility in New Mexico.

In December of 2005, Stephanie's dream came true and she was hired into the Materials and Processes Branch at Johnson Space Center. She says her biggest "wow" moment in the program was simply getting hired. "Just the idea that I was going to be part of something that very few people in the world get to be part of—that I can go home and feel in every way great and excited about what I do everyday at work."



*The twins turned their love for the sciences into exciting NASA careers.*

## Much more than an ounce of passion

As relatively new hires, Stephanie and Susana have just five years, combined, at NASA. But they have an enthusiasm for their work similar to the people who have been with the program since the Apollo days. Stephanie says that working at NASA means "you love what you do and you can work for something that has a goal and a drive much bigger than you could ever imagine." Susana echoed her sentiments. "Most people, in whatever job it is, don't have even an ounce of the passion that everyone at NASA seems to have."



*Susana Tapia credits her strong work ethic to her parents, who are both first-generation immigrants to the United States.*

# SPACE SHUTTLE MISSION STS-122: The Voyage of Columbus

By Brandi Dean



NASA JSC2007E049826

*STS-122 crew members take a moment to pose for a photo during a training session in the Space Vehicle Mockup Facility at Johnson Space Center. From the right are astronauts Steve Frick, commander; Alan Poindexter, pilot; Leland Melvin, Rex Walheim, European Space Agency's Hans Schlegel and Stanley Love, all mission specialists.*

**S**pace Shuttle *Atlantis*' mission on STS-122 is what everyone's been working toward: expanding the science capabilities of the International Space Station.

Over the past year-and-a-half, solar arrays and a connecting module have been added for power and to provide a pathway to new modules. But the mission of *Atlantis*' crew will mark the beginning of the culmination of all that work.

"This is the next phase of the international mission," said Michael Sarafin, lead shuttle flight director for STS-122. "We're finally going to use a lot of that new capability that we've delivered. It really will be true utilization of the station by international partners."

That utilization comes in the form of Columbus, a 23-by-15-foot research laboratory and the future center of the European Space Agency's (ESA's) activities in space. It will be followed over the next two missions by components of the Japan Aerospace Exploration Agency's module, called Kibo. But, for now, the focus is on Europe. In addition to the Columbus module, *Atlantis* will deliver experiments to be

performed in orbit and two astronauts to perform them—one to visit and one to stay.

To oversee all of this, the European Space Agency's Columbus Control Center in Oberpfaffenhofen, Germany, will come online for the first time.

"This is history," said Mission Specialist Léopold Eyharts, the ESA astronaut from France who will remain on the station after his shuttle crewmates leave. "Europe is doing today things that we never did before. This is really a first step into permanent operations in space."



NASA JSC2007E21182

*European Space Agency (ESA) astronaut Leopold Eyharts (foreground), Expedition 16 flight engineer; astronaut Stanley Love and ESA astronaut Hans Schlegel, both STS-122 mission specialists, participate in a training session in one of the full-scale trainers in the Space Vehicle Mockup Facility at JSC. United Space Alliance Suit Technician Mike Thompson assists the crew members.*



Eyharts will take—or float—the literal first step into Columbus, but he and his crewmates will have a lot of work to do before he gets to that point. Even getting the laboratory out of *Atlantis*' cargo bay will be a challenge. Columbus was designed before NASA's Return to Flight following the *Columbia* accident. One of the modifications made to the shuttle was the addition of a 50-foot boom used by the shuttle's robotic arm to inspect the shuttle's heat shield. There's not quite room for that addition and all of Columbus.

The grapple fixture—or handle—that the robotic arm uses to pick Columbus up and out of the cargo bay gets in the way of the boom, so the laboratory is being launched without the handle attached. During the mission's first spacewalk, mission specialists Rex Walheim and Hans Schlegel, an ESA astronaut from Germany, will put it back on.

"That has to go exactly as planned," Sarafin said.

"Otherwise we can't get Columbus out of the payload bay."

Once it's out, however, the installation should be pretty straightforward, according to Lead Station Flight Director Sally Davis.

"I think I'll jinx it if I say it's going to be easy to install," she said. "But the actual mechanical connection is a common berthing mechanism, which we've used many times in the past. I don't foresee any problems with that."

Once those connections are made on the shuttle's fourth day in space and a few preparations are completed, Eyharts will be able to take a quick peek inside Columbus on the following day.

"I think it will be very emotional," Eyharts said. "If we think of all the work that has been done, being the last part in the chain is something that is really nice and fills us with pride. I think that will be very visible."

NASA's ground control will be in charge of some of the initial activation of Columbus' systems, but once the laboratory's computers are up and running, the Columbus Control Center will take over. That doesn't mean, however, that Eyharts and Schlegel's American crewmates—Walheim, Commander Steve Frick, Pilot Alan Poindexter, Mission Specialists Stanley Love and Leland Melvin, and station Flight Engineer Daniel Tani, who will come back in Eyharts' place—will abandon them to the work.

Sarafin said just about any time the crew is not doing a spacewalk, they'll be working inside Columbus to get it up and running. In fact, Frick said much of the transformation will take place while the shuttle is still there. The goal is to get as much of Columbus' outfitting done as possible. That way, after the shuttle leaves, Eyharts can devote more time to science.

"I think it's great, because we have been focused so much on basically assembling the infrastructure of the station—the trusses that provide power and cooling and data and



NASA/SHIFLETT 07PD3291

*Inside the payload change-out room on Launch Pad 39A, a technician monitors the progress of the Columbus Laboratory module as it is transferred into Space Shuttle Atlantis' payload bay. The lab module, built by the European Space Agency (ESA), can hold 10 large racks of experiments. Columbus is ESA's largest single contribution to the space station.*

communications," Frick said. "So once we get this up and running, because they've got all those trusses up there to provide electrical power, they'll be able to activate these experiments and start doing excellent science."

Davis said her European counterparts are eagerly anticipating doing just that, and she can understand why. Her first mission as a flight director was in 1998, when the Unity Node—the first major U.S. component—was added, and she remembers the excitement.

"When the moment arrived for them to open the hatch and float in, it was like angels sang," Davis said. "I thought, 'Wow. That's great stuff.' I'm sure the folks in the Columbus Control Center will feel the same way when they watch the hatch open and watch their crew members go into their module for the first time."



# Ballunar Festival



NASA/STAFFORD JSC2007E09723



NASA/STAFFORD JSC2007E098067



NASA/STAFFORD JSC2007E097476

On Nov. 2-4, the 15th annual Ballunar Liftoff Festival transformed Johnson Space Center. Visitors were treated to an exciting and educational family oriented event that featured hot air balloon competitions, evening balloon glows, skydiving exhibitions, commercial exhibits, concession booths, food from local restaurants, arts and crafts exhibits, entertainment and various aviation displays. Astronauts also signed autographs in the Saturn V building and RE/MAX tent. In conjunction with Ballunar, JSC hosted a mini tour on Saturday, Nov. 3, showcasing Buildings 9N, 11, 14, 29, 32 and the Saturn V complex. Guests got a chance to view the space shuttle and station full scale mockups, robotic exhibits, spacesuits, tools, Thermal Vacuum Chamber, Astromaterials displays and more at this one of a kind event.



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## Space Center Roundup

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